

$^{47}\text{Ti}(\text{p},\text{n}\gamma)$ [1975Th10,1974Sc25](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Ota and E. A. Mccutchan		NDS 203,1 (2025)	1-Apr-2025

[1973B111](#): E(p)=3.6-5.3 MeV. Measured $E\gamma$, $I\gamma$, $\gamma(\text{t})$, $\gamma(\theta)$ using Ge(Li) detector and Ece, Ice using magnetic spectrometer focused on a Si(Li) detector. Also reports data from the $^{40}\text{Ca}(^{10}\text{B},2\text{pn})$ reaction.

[1974Sc25](#): E=3.8-6.0 MeV. Measured $E\gamma$, $I\gamma$, and $\text{n}\gamma$ -coincidences and $\gamma(\theta)$, $\theta=0^\circ-90^\circ$ using Ge(Li) detectors.

[1975Th10](#): E=4.7-5.4 MeV. Measured $E\gamma$, $I\gamma$, γ -ray excitation functions, $\gamma(\theta)$, $\theta=0^\circ-90^\circ$ (15° steps); deduced lifetimes using DSAM.

Others: [1976Wh01](#), [1967Me18](#).

 ^{47}V Levels

E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	Comments
0.0	$3/2^-$		
87.5 1	$5/2^-$	0.66 ns 4	
145.7 2	$7/2^-$	0.54 ns 7	
259.6 4	$3/2^+$	54 ps 8	
660.1 3	$5/2^+$	0.47 [@] ps +97-24	
1138.3 4	$7/2^+$	0.7 [@] ps +12-3	J^π : from $\gamma(\theta)(879\gamma)$, $\gamma(\theta)(478\gamma)$ and $\gamma(\theta)(1050\gamma)$ (1975Sc25); $\pi=+$ from D,E2 γ to $3/2^+$.
1272.2 4	$9/2^-$	0.27 [@] ps +27-10	J^π : from $\gamma(\theta)(1184\gamma)$ and $\gamma(\theta)(1126\gamma)$.
1295.1 4	$9/2, 11/2$	>42 [@] ps	J^π : from $\gamma(\theta)(1149\gamma)$ (1974Sc25).
1660.0 ^{&} 25	$1/2^+$		
1747.1 ^{&} 10	$7/2, 9/2$		J^π : from $\gamma(\theta)(1087\gamma)$ (1974Sc25).

[†] From [1975Th10](#), except as noted.

[‡] As proposed by [1974Sc25](#) and [1975Th10](#).

[#] From pulsed-beam centroid measurement, except as noted. $T_{1/2}(88)=817$ ps 26 corrected for the shift due to 58γ .

[@] From [1975Th10](#).

[&] From [1974Sc25](#).

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$\gamma(^{47}\text{V})$									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. #	$\delta^\#$	$\alpha(\text{exp})^\oplus$	Comments
87.5	5/2 ⁻	87.5 1	100	0.0	3/2 ⁻	M1+E2	0.128 22	0.0411 28	$\alpha(\text{K})\text{exp}=0.0372$ 27 Mult., δ : from $\alpha(\text{K})\text{exp}$ and $\alpha(\text{L})\text{exp}$. $\alpha(\text{K})\text{exp}$: from 1967Me18. E_γ : other: 87.7 5 (1973B111). $\alpha(\text{L}+\dots)\text{exp}=0.00467$ 67 (1967Me18), $\text{K}/(\text{L}+\text{M}+\text{N})=7.95$ 48 (1967Me18). E_γ : other: 57.9 5 (1973B111). I_γ : others: 99.80 5 (1973B111), 98.4 5 (1974Sc25). E_γ : other: 146.0 5 (1973B111). I_γ : others: 0.20 5 (1973B111), 1.5 5 (1974Sc25). I_γ : others: 11 1 (1973B111), 12 4 (1974Sc25). I_γ : others: 89 1 (1973B111), 88 4 (1974Sc25). $\alpha(\text{exp})=0.00073$ 8 (1973B111) I_γ : other: 37 1 (1973B111).
145.7	7/2 ⁻	58.2 1	99.0 5	87.5	5/2 ⁻				
		145.7	1.0 5	0.0	3/2 ⁻				
259.6	3/2 ⁺	172.2 6	13 1	87.5	5/2 ⁻				
		259.4 5	87 1	0.0	3/2 ⁻				
660.1	5/2 ⁺	400.8 5	29& 3	259.6	3/2 ⁺	M1			
		514	18& 4	145.7	7/2 ⁻				
		572.5 5	15& 3	87.5	5/2 ⁻				
		660.1 3	38& 3	0.0	3/2 ⁻				
1138.3	7/2 ⁺	478.0 5	18 5	660.1	5/2 ⁺	D+Q			
		878.7 3	30 5	259.6	3/2 ⁺	Q(+O)	-0.12 23		
		993	4 2	145.7	7/2 ⁻				
		1050.0 7	44 5	87.5	5/2 ⁻	D(+Q)	<+0.2		
		1138	4 3	0.0	3/2 ⁻				
1272.2	9/2 ⁻	1125.7 5	82 2	145.7	7/2 ⁻	D+Q			
		1184.5 3	18 2	87.5	5/2 ⁻	Q(+O)	+0.01 6		
1295.1	9/2,11/2	157 ^a	<12&	1138.3	7/2 ⁺				
		635 ^a	<8&	660.1	5/2 ⁺				
		1035 ^a	<7&	259.6	3/2 ⁺				
		1149.4 4	100&	145.7	7/2 ⁻	Q(+O)	+0.01 4		
		1208 ^a	<6&	87.5	5/2 ⁻				
		1295 ^a	<5&	0.0	3/2 ⁻				
1660.0	1/2 ⁺	522 ^a	<22&	1138.3	7/2 ⁺				

⁴⁷Ti(p,n γ) [1975Th10,1974Sc25](#) (continued)

$\gamma(^{47}\text{V})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [#]	$\delta^\#$	Comments
1660.0	1/2 ⁺	1000 ^a	<17&	660.1	5/2 ⁺			
		1401	78& 16	259.6	3/2 ⁺			
		1514	<16&	145.7	7/2 ⁻			
		1572 ^a	<16&	87.5	5/2 ⁻			
		1660	22& 16	0.0	3/2 ⁻			
1747.1	7/2,9/2	452 ^a	<9&	1295.1	9/2,11/2			
		475 ^a	<8&	1272.2	9/2 ⁻			
		609 ^a	<30&	1138.3	7/2 ⁺			
		1087	60& 12	660.1	5/2 ⁺	Q(+O)	-0.02 27	Mult., δ : for J(1747)=9/2. For J=7/2, $-7.1 \leq \delta \leq -0.3$.
		1488 ^a	<7&	259.6	3/2 ⁺			
		1601	40& 12	145.7	7/2 ⁻			
		1660 ^a	<7&	87.5	5/2 ⁻			
		1747 ^a	<6&	0.0	3/2 ⁻			

[†] Energies with uncertainties are from [1975Th10](#), except where noted. Energies without uncertainties are from level energy difference.

[‡] Percent photon branching ratios from each state from [1975Th10](#) except where noted.

[#] From $\gamma(\theta)$ ([1974Sc25](#)), except where noted.

@ From [1973Bl11](#). $\alpha(\text{exp})$ were normalized assuming $\alpha(E1)=0.001726$ for 260γ from theory.

& From [1974Sc25](#).

^a Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: % photon branching from each level

-----► γ Decay (Uncertain)

● Coincidence

